

B1
CAND. d. determining the relative order at each railcar in the train as a function of the time of receipt of said second electrical signals.

Remarks

The claims have been amended to further clarify applicant's invention and the changes are highlighted in Exhibit A. Claim 51 has been cancelled and Claim 52 has been rewritten in independent form including all limitations of Claim 51.

The Office Action states the information disclosure statement submitted by the applicant is improper because it is not PTO-1449 form. However, PTO-1449 form is not mandatory, and applicant's information disclosure statement meets all of the requirements of 37 C.F.R. 1.97 and 1.98. The MPEP acknowledges that PTO-1449 form is not mandatory "Once the minimum requirements of 37 C.F.R. 1.97 and C.F.R. 1.98 are met, **the examiner has an obligation to consider the information....**The initials of the examiner placed adjacent to the citations on the PTO-1449 or PTO/SB/08A and 08B **or its equivalent** mean that the information has been considered by the examiner to the extent noted above." MPEP 609 (emphasis added). Reconsideration of applicant's information disclosure statement is requested.

Claims 22, 23, 26-35 and 37-57 are rejected as anticipated by Stevens.

Reconsideration of this rejection is solicited.

? Stevens discloses that the relative position of a railcar in a trainline can be determined based on the absolute difference in time between two signals measured at each railcar in the trainline. For example, Stevens discloses the use of two signals, an electronic synchronization signal, i.e., an RF transmission from a locomotive, and a serial

signal, i.e., a brake pipe pressure pulse from the locomotive, both of which are transmitted along the length of the train. Each railcar measures the absolute time difference between the receipt of the synchronization signal and the receipt of the serial signal. Note that the absolute time difference between the receipt of the synchronization signal and the serial signal will increase as the distance of the railcar from the locomotive increases along the length of the trainline. Upon receipt of the synchronization and serial signal, each railcar transmits the measured absolute time difference to the locomotive where the measured time differences are sorted and the relative position of the railcars can be determined. Stevens additionally discloses that each railcar can determine its own relative position by monitoring the transmissions of each railcar and comparing its measured time difference with the measured time differences transmitted by the other railcars. Note that Stevens determines the relative order of the train based on the content of the signal, i.e., the measured time difference, received from each railcar, without regard to the time of receipt of the signal transmitted from each railcar.

Applicant's disclosure is directed to solving the problems experienced in using a serialization system such as disclosed in Stevens. In Stevens, the ability to determine the relative position of the railcars is dependent upon substantially all of the railcars receiving both the synchronization signal and the serial signal. When the synchronization signal is an RF signal, the RF propagation path can be seriously degraded by the propagation environment, the length of the trainline and interference from other transmitters, e.g., other trains in the area. Thus railcars distant from the locomotive (or railcar) transmitting the synchronization signal may have difficulty receiving the

synchronization signal and/or accurately determining a time of receipt of the synchronization signal.

When the serial signal is a brake pressure pulse, the pressure pulse tends to smear as it propagates through the brake pipe making it more difficult for the railcars more distant from the transmitting locomotive to determine an accurate time of arrival of the brake pulse.

Applicant proposes solutions to these problems. Applicant discloses that a head end unit (HEU) initiates an RF transmission and a brake pipe pressure pulse. Upon receipt of the RF transmission at the first railcar, the railcar starts a timer and awaits the receipt of the pressure pulse. Upon receipt of the pressure pulse, the first railcar transmits an RF signal indicating that it is the first railcar. Each railcar which hears the transmission from the first railcar resets its timer and measures the time between the receipt of the first car's RF transmission and the pressure pulse. Upon receipt of the pressure pulse, the second car transmits an RF signal indicating that it is the second car. Each subsequent railcar follows the same procedure, resetting its timer upon receipt of an RF signal from another railcar and ultimately determining its relative position based upon the receipt of the RF signal from the immediately preceding railcar and the receipt of the pressure pulse. Thus, by determining the relative position based upon the time of receipt from the immediately preceding railcar, the propagation path is shortened making it more likely that each railcar will receive and recognize the transmitted RF signal, and therefore a synchronization signal is unnecessary. Additionally, applicant discloses that each railcar can sharpen the brake pipe pressure pulse by venting its supply pipe immediately

upon detecting the pulse edge, thus facilitating the recognition and measurement of the time of receipt of the pressure pulse by all railcars.

Thus unlike Stevens, applicant discloses that the relative position of each railcar can be determined based on the **time of receipt** of the signal transmitted by the immediately preceding railcar, **without regard to the content of the received signal**, i.e., it does not need to know the time difference measured by the immediately preceding railcar. Where necessary, the independent claims have been amended to clarify that the relative position of the railcars is determined based upon the difference in time of receipt of the pressure pulse and the transmission from the immediately preceding railcar.

Independent Claims 22, 28, 29, 32, 38, and 41 recite, *inter alia*, that the relative position of a railcar is determined as a function of the time between the receipt of the pneumatic pulse and the time of receipt of the immediately preceding or last received signal from another railcar. As discussed above, Stevens determines the relative position of the railcars as a function of the absolute time between the receipt of the synchronization signal (RF single from the locomotive) and the serial signal (brake pressure pulse from the locomotive). Note that there is no disclosure in Stevens of measuring the time between the receipt of the last RF transmission from a preceding railcar and receipt of the pressure pulse. Reconsideration and allowance of Claims 22, 28, 29 32, 38 and 41 is solicited.

Claims 23-27, 30, 31, 33-37, 39, 40, and 42 ultimately depend from the above identified independent Claims and are therefore allowable with their respective base claims without recourse to the further patentable limitations respectively recited therein.

Likewise, Independent Claims 43 recites the limitation, *inter alia*, that each railcar determines its relative position using the time of receipt of a signal received in closest proximity to the pneumatic signal. In Stevens the relative position is determined based on the absolute time difference between the synchronization signal and serial signal without regard to whether the synchronization signal is closest in proximity to the pneumatic signal. Reconsideration and allowance of Claim 43 is solicited.

Claims 44, 52 and 57, each recite, *inter alia*, that the relative position of a railcar is determined based upon the time of receipt of a signal from another railcar transmitted upon receipt of the pressure pulse at the other railcar. Stevens determines the relative position of the railcars without regard to the receipt of a signal from another railcar transmitted upon receipt of the pressure pulse at the other car. Reconsideration and allowance of Claims 44, 52 and 57 is requested.

Claims 45-50 and 53-56 ultimately depend from Claims 44 and 52, respectively, and are therefore allowable with their respective base claims without recourse to the further patentable limitations respectively recited therein.

Applicant respectfully requests reconsideration and allowance of all pending claims.

Respectfully submitted,

P.D. McPherson

L. Lawton Rogers, III

Reg. No. 24,302

D. Joseph English

Reg. No. 42,514

Mark C. Comtois

Reg. No. 46,285

Patrick D. McPherson

Reg. No. 46,255

DUANE MORRIS LLP
1667 K Street, N.W., Suite 700
Washington, D.C. 20006
Telephone: (202) 776-7800
Telecopier: (202) 776-7801

Dated: January 9, 2002